

April 27, 2018

William F. Lane, General Counsel
Michael A. Abraczinskas, Director, Division of Air Quality
North Carolina Department of Environmental Quality
Raleigh, NC 27699

Re: 60-Day Notice of Intent to Modify Air Quality Permit No. 03735T43
The Chemours Company, Fayetteville Works

Dear Messrs. Lane and Abraczinskas,

On behalf of The Chemours Company FC, LLC (“Chemours”), we respectfully submit this response to the 60-Day Notice of Intent to Modify Air Quality Permit No. 03735T43 issued by the North Carolina Department of Environmental Quality (“DEQ”), Division of Air Quality (“DAQ”), dated April 6, 2018 (the “Notice”). The Notice concerns the groundwater impacts from air emissions of GenX compounds¹ from Chemours’s Fayetteville, North Carolina facility (“Fayetteville Works” or “the facility”).

SUMMARY

A. As has been discussed for months with DEQ, Chemours is in the process of making a massive investment in Fayetteville Works to make it a best-in-class facility with respect to air and wastewater emission control. The investment will include installation of an array of state-of-the-art technology, including a thermal oxidizer (which is on order), as well as a thermolysis reactor and other technology that we understand no other chemical facility in the world has in combination. This technology is expected to result in an overall 99% reduction of air emissions of GenX compounds, with the thermal oxidizer alone expected to destroy 99.99% of the GenX compounds and other per- and poly-fluorinated compounds (“PFAS”) that will be routed to it. Chemours is making this investment — which, together with the other steps described below, will ultimately cost more than \$100 million — to demonstrate its commitment to continuing to operate the facility in North Carolina and to resolve community concerns. And Chemours will stand behind the expected reductions in air and wastewater emissions: with respect to air emissions, it is willing to commit to DEQ in a binding agreement that, once installed, this

¹ For ease of reference, and to match the terminology used in the Notice of Intent, we collectively refer in this letter to HFPO Dimer Acid, HFPO Dimer Acid Ammonium Salt, and Dimer Acid Fluoride (“DAF”) as “GenX compounds.” Exhibit cites refer to the exhibits that accompany this response.

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technology will ensure that overall air emissions of GenX compounds are reduced from current levels by 99%.

As has likewise been discussed, this technology consists of custom-designed, specialized equipment that must be custom-built and will take approximately 18-24 months to manufacture and install. Accordingly, although the design-and-manufacturing process is underway, Chemours has also agreed to take multiple additional measures in the interim to control and abate air emissions. These measures include the installation of carbon adsorption beds in May, upgrades to the waste gas scrubber from May through October, and a continuation of the enhanced Leak Detection and Repair (“LDAR”) program that began in January. As has been discussed, these steps comprise *every possible interim air-emission-abatement measure* that can be effectively and reasonably implemented while the full control technology is being constructed. Chemours expects these interim measures to substantially reduce air emissions of GenX compounds almost immediately and to eliminate the majority by the end of the year: an estimated 40% reduction by the end of May, and an estimated 70% reduction by October — again, leading up to the 99% reduction once the full control technology is in place by late 2019 or early 2020. During this interim period, moreover, Chemours will continue both (1) its ongoing program of capturing for off-site disposal all process wastewater generated by its Fayetteville Works operations, a program that has resulted in consistent readings at all drinking-water intake sites of GenX concentrations below 140 ppt; and (2) its ongoing efforts to address existing groundwater issues, including an ongoing on-site remediation program and the testing and offer of granular-activated-carbon units to area residents whose wells have tested over 140 ppt for GenX.

The full array of control technology and interim measures is fully detailed in Section I below. But in short, at enormous expense, Chemours will eliminate the majority of air emissions of GenX compounds this year through every abatement measure that can be effectively and reasonably implemented in that timeframe, and will essentially eliminate those emissions entirely in 18-24 months. Chemours has kept DEQ fully informed of the plan as it was developed over the past seven months, shared all the technical details, and adapted the plan multiple times to respond where possible to DEQ questions about it.

B. Against this backdrop, Chemours was surprised to receive the Notice. The Notice makes no mention of any of the measures Chemours is taking. Nor does the Notice even claim that air emissions pose a public health emergency *now*, much less one that will persist as the interim and long-term measures are implemented. Instead, the Notice purports to impose conditions on Chemours that have no legal basis and that DEQ has never even tried to impose on anyone else. Although Chemours has made clear that

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it did not expect DEQ to *endorse* the measures being taken until we show that the control technology in fact performs as anticipated, Chemours did not expect DEQ to act as if those measures were not being taken at all.

Nevertheless, in furtherance of its ongoing efforts to cooperate with DEQ, Chemours will demonstrate in this response its compliance with the conditions in the Notice. The Notice asks Chemours to demonstrate either that “emissions of GenX compounds from the Fayetteville Works under current conditions” or “under alternate conditions proposed by Chemours will not cause or contribute to violations of the groundwater rules.” The purported “groundwater rule,” in turn, refers to the 10 ppt minimum technical detection limit for GenX (the so-called “practical quantitation limit”). In other words, DEQ is asking Chemours to demonstrate that its operations will not cause groundwater levels of GenX compounds to increase by more than 10 ppt over current levels.

As detailed in Section II below, this response makes the requested demonstration in two separate ways, based on work done by Chemours’s consultants in the highly abbreviated 3-week time period that DAQ demanded for the response.

First: Geosyntec Consultants of NC, P.C. (“Geosyntec”), a leading environmental consulting firm, analyzed existing groundwater conditions based on currently available evidence. Geosyntec’s analysis is attached as Exhibit 10. It shows that under current operating conditions, the groundwater at the facility is likely in a steady state: that is, current operating conditions should lead to neither an increase nor a decrease in groundwater levels that have arisen through historical deposition of GenX compounds (principally by Chemours’s predecessor). By extension, the analysis shows that as air emissions of GenX compounds are reduced through the interim measures and control technology, the groundwater levels will start to *decrease* from current levels and will continue to *decrease* at an increasing rate as air emissions are further reduced.

Second: ERM NC, Inc. (“ERM”), likewise a leading environmental analytic consulting firm, performed air deposition modeling, employing a methodology similar to that used by DAQ, of the reduced emissions levels of GenX compounds that will be achieved this year and in the future under the measures described above and detailed more fully below. It then analyzed the expected impact that such air deposition would have on GenX compound levels in groundwater in the area surrounding the facility. The modeling and analysis shows, as detailed in their report which is attached as Exhibit 11, that air emissions at those levels will not cause expected groundwater levels of GenX compounds to increase by more than 10 ppt.

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In addition, as portions of these analyses are premised on the installation of the interim air-emission-abatement measures and the control technology, Chemours is willing to agree to a modification of its air quality permit to require that it proceed with the measures and technology as described at pages 22-23 below. There is no legal requirement that Chemours accede to such a modification, but Chemours is willing to do so to underscore its commitment on these issues.

C. Chemours hopes and expects that DAQ will conclude that this response adequately addresses the issues raised in the Notice. In addition, Chemours is willing to meet with DAQ to discuss this response and answer any questions DAQ may have about it.

At the same time, we also need briefly to address one other matter. At the end, the Notice threatens that, if DAQ deems the response insufficient, it will modify Chemours's air quality permit "to prohibit emissions of GenX compounds." To the extent DAQ is suggesting that it will impose a zero-emission standard, DAQ knows such a standard would be impossible for Chemours to meet and DAQ has never imposed such a standard on anyone else or as to any other compound.

Although we do not want to belabor the point here, we need to make clear that such an action would be improper and illegal. The reasons, which are summarized more fully in Section III below, include:

No power to modify the permit. The Notice attempts to invoke the authority to modify a permit if "[t]he conditions under which the permit . . . was granted have changed." But no applicable condition has changed. In granting the permit in 2016, DAQ did not require any limit specific to or information specifically about GenX compounds. Rather, it set only an overall limit for total volatile organic compounds ("VOCs"), including GenX compounds, for certain units, including a limit of 68.9 tons per year for the unit which generates most of the emissions of GenX compounds. The Notice does not allege that Chemours exceeded this limit. And while the Notice cites recent tests that measured air emissions of GenX compounds at levels higher than previously estimated, even the higher levels of slightly over 1 ton per year remain a tiny fraction of the overall limit.

No public health emergency. The Notice does not even allege a public health emergency that warrants an unprecedented zero-emission requirement. Nor could it. The Notice purports to base the threatened zero-emission demand on concerns about increases in groundwater levels in excess of 10 ppt, which is the current practical quantitation limit. But the State's interim health guideline for *drinking* water which is actually consumed is

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140 ppt. Additionally, the 10 ppt limit is completely divorced from standard risk assessment procedures because it is not based on actual exposures and does not include any evaluation of exposure durations, frequencies, groundwater usage, or, indeed, any assessment of risk. Therefore, there is no basis for the 10 ppt limit to be used to suggest a public health emergency.

Arbitrary and capricious. DEQ has never imposed a zero-emission requirement or an air emission standard tied to a 10 ppt groundwater standard before. Nor is it doing so now with respect to anyone else or any other compound — including the 1,4-dioxane that was recently detected in the Cape Fear River at elevated concentrations above screening levels and that is not attributable to Chemours. Indeed, the arbitrariness of a zero-emission requirement and the 10 ppt standard is underscored by the fact that the standard, i.e., the practical quantitation limit, has no relationship to predicting a public health emergency. Implementation of such a standard is not consistent with standard practices of exposure assessment or toxicology. In addition, the standard is inconsistent with the vastly higher groundwater standards that DEQ has in place for toxic and/or carcinogenic compounds like 1,4-dioxane (3,000 ppt), arsenic (10,000 ppt), and lead (15,000 ppt).

Instead, in other situations, with respect to other compounds, DEQ has addressed groundwater limits through the established IMAC process. Chemours has now submitted a formal request for an IMAC for HFPO Dimer Acid, and available science supports an IMAC of at least 70,000 ppt (consistent with the State's initial drinking water guideline for GenX of 71,000 ppt). DEQ should respect the IMAC process and await its outcome before setting any limit, much less a 10 ppt limit that is lower than the interim drinking water guideline. Singling out Chemours for different treatment would be arbitrary and capricious, especially in view of all the measures Chemours is taking and in the absence of any health emergency.

* * * *

The materials produced at Fayetteville Works, including GenX, are critical to the State's and the nation's economy. Every airplane, automobile, cell phone and other communication device requires fluoropolymers. Fluoropolymers are also key components of consumer electronics, of micro-chips for the semiconductor industry and of life-saving medical equipment, from catheters, to saline bags, to medical analytical equipment. Fayetteville Works supplies a substantial percentage of the fluoropolymer needs of the U.S. military, the automobile industry, the aerospace industry and the semiconductor industry among many others — all of whom would otherwise confront severe shortages of these critical inputs for their products and/or be forced to turn to suppliers from China or other foreign nations. Chemours inherited Fayetteville Works

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from DuPont in July 2015, less than three years ago, and is committed to operating it in an environmentally sound manner that will best serve the hundreds of employees who work at the facility, the customers whose businesses require the facility's products, and the North Carolina community at large.

Chemours recognizes and appreciates the concerns that surfaced beginning last June, and has done its best to limit emissions and address those concerns. Extraordinary progress has already been made in the 10 months since June. Chemours is now poised to address air and other emissions in a manner in which Chemours and DEQ can demonstrate industry and regulatory leadership, respectively. Throughout this process, Chemours has endeavored to work with DEQ to resolve community concerns, even though it believes that many of the allegations against it are inaccurate and unfair (including the allegation that the regulators were misled). Chemours wants to proceed with its huge investment in Fayetteville Works so that the facility can continue to operate in North Carolina, contribute to the North Carolina economy and employ hundreds of North Carolinians in a manner that instills full public confidence. We submit that DEQ and DAQ should allow Chemours to do so.

BACKGROUND

We begin with the background facts regarding the Fayetteville Works air quality permit and current air emissions of GenX compounds.

I. Fayetteville Works' air quality permit

Fayetteville Works currently operates pursuant to Clean Air Act Title V Air Quality Permit No. 03735T43 (the "Permit"). The Permit, which is attached as Exhibit 14, was issued by DAQ on December 14, 2016 and is effective until March 31, 2021.

The Permit does not set specific emissions limits for GenX compounds. Rather, it sets overall limits for certain processes at the facility for the entire category of volatile organic compounds ("VOCs"), a category that includes GenX compounds as well as many others. The Permit's limit for total VOCs for the Vinyl Ethers North Process (which testing shows is the source of most air emissions of GenX compounds) is 68.9 tons per consecutive 12-month period. To put this in context, the recent testing cited in the Notice measures annual air emissions of GenX compounds from the Vinyl Ethers North Process at approximately $\frac{3}{4}$ of 1 ton and total annual emissions of GenX compounds from the entire facility at slightly more than 1 ton.

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II. No allegation that Chemours has violated the Permit

The Notice does not claim that Chemours has violated the Permit. Although the Notice complains that recent tests measured air emissions of GenX compounds at levels higher than prior estimates, the numbers just cited show that even the higher amounts remain a small fraction of the overall limits. Indeed, the entire reason the Notice threatens to *modify* the Permit is that DAQ does not claim that Chemours is in violation of the Permit as it now exists.

III. Chemours has developed new, innovative stack testing methods that quantify air emissions more accurately and confirm that Chemours is in compliance with the Permit.

Until very recently, there was no available technology and no approved test method to conduct stack testing to measure actual air emissions of GenX compounds. Accordingly, as part of Chemours's efforts to cooperate fully, its scientists and engineers worked extensively beginning in 2017, in coordination with DAQ, to develop new and innovative methods for sampling and analyzing GenX compounds. Chemours has now employed these methods in three separate rounds of stack testing for GenX compounds at Fayetteville Works in the first quarter of 2018. Using those results, Chemours now estimates that its total air emissions of GenX compounds for 2017 were approximately 2300 pounds — or 1.15 tons.² The reports for the three rounds of stack testing are attached as Exhibit 1.

The immediate import of this testing is confirmation that the facility is in compliance with the Permit. 1.15 tons is nowhere near 68.9 tons or any of the other overall limits, and even with the addition of emissions of VOCs other than GenX compounds, the facility is well under the limits.

More generally, the new testing methods have allowed Chemours to more accurately identify the sources of the air emissions of GenX compounds, to more accurately quantify the levels of air emissions from each source, to design interim and long-term measures and technology to reduce those levels, and to estimate the degree of reduction that particular measures and technologies will produce. Because this response will devote considerable attention to the expected reductions from the array of measures Chemours is taking, we will start by setting out the current sources and their respective emission levels.

² This 2300 pound estimate is lower than the 2700 pound estimate referenced in the Notice. This difference is likely a result of the recent lower estimate of outdoor fugitive emissions discussed below.

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The following table summarizes the overall 1.15 ton estimate and breaks it down by the process involved, including specifying whether the emissions are estimated to be from process emissions, indoor equipment leaks or outdoor equipment leaks. A report from ERM reviewing and confirming these estimates based on available information is attached as Exhibit 2.

Process Area	Process Emissions (lbs)	Indoor Equipment Emissions (lbs)	Outdoor Equipment Emissions (lbs)	Total Emissions (lbs)
Vinyl Ethers North	1506	2.5	1.7	1510.2
Vinyl Ethers South	114	1.6	0.4	116
PPA	639	31.2	1.0	671.2
Polymers	4.8	0	0	4.8
Semi-Works	0.35	0.15	0	0.5
Total				2302.7

A number of elements of this table bear further explanation:

Vinyl Ethers North. As set forth in the table, the emissions from the Vinyl Ethers North process and indoor equipment leaks are estimated at 1508.5 pounds a year. The process emissions and indoor equipment emissions for Vinyl Ethers North both vent to the same stack (the Division Stack). The total emissions of GenX compounds from that stack were measured during two rounds of stack testing, one done on January 22-25, 2018, while the facility was running a PPVE campaign (which had, as had been expected, the highest levels of emissions of GenX compounds), and the other during the week of March 19, 2018, when the facility was running a PSEPVE campaign (which had much lower levels of such emissions).³ The hourly emissions rate calculated for each campaign was multiplied by the number of hours each campaign ran to get a total emission volume for that campaign.⁴ The allocation of a small amount of emissions (2.5 pounds) to indoor

³ As discussed in the report for that testing, only one of the three March runs conducted on Vinyl Ethers North was a valid run, and that one run was used to estimate the emissions.

⁴ There is a third campaign conducted only infrequently at Vinyl Ethers North that produces a substance referred to as EVE. No stack testing has yet been done during an EVE campaign, and so the hourly

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equipment leaks was based on work done by ERM and described in their report (Exhibit 2). In addition, planned inlet and outlet testing will provide further information on quantification of emissions from indoor equipment leaks.

Vinyl Ethers South. As set forth in the table, the 2017 emissions from the Vinyl Ethers South process and indoor equipment leaks are estimated at 115.6 pounds. As with Vinyl Ethers North, the process and indoor air emissions at Vinyl Ethers South vent to the same stack and the combined emissions were measured. The Vinyl Ethers South stack was tested during the week of February 26, 2018, during a PMVE/PEVE campaign. The results show that, while there are detectable levels of emissions of GenX compounds during a manufacturing campaign producing compounds other than PPVE, they are very low. It is estimated that, based on 2017 production data, emissions of GenX compounds from the PMVE/PEVE campaigns were an annual aggregate of 7.6 pounds. Vinyl Ethers South is not scheduled to run a PPVE campaign during 2018, and so has not been tested during such a campaign. Because it did run such a campaign in 2017, the emission rate for PPVE from Vinyl Ethers North was used, together with 2017 production information, to calculate the emissions of GenX compounds during the PPVE campaign in Vinyl Ethers South in 2017; it was calculated at 108 pounds.

PPA Process. As set forth in the table, the emissions from the PPA process and indoor equipment leaks are estimated at 670.2 pounds per year. These emissions were calculated based on stack tests conducted in January and February. The second round of testing was conducted to understand the variability that was seen in the emissions from the PPA stack during the three runs from the first test. The second test was designed to determine the effect of two batch processes, vaporization and hydrolysis, on GenX compound emissions. The results have allowed the facility to calculate, and ERM to verify, based on the time the relevant processes were running, a total emission from the PPA stack for 2017 of 670.2 pounds. The allocation of 31.2 pounds of the emissions to indoor equipment leaks was based on direct measurements of the indoor air venting to the stack prior to its mixing with the scrubber exhaust.

Outdoor air emissions. As set forth in the table, the aggregate emissions of GenX compounds for outdoor equipment leaks (*i.e.* fugitive emissions) are estimated at 3.1 pounds per year. This latest estimate of outdoor fugitive emissions is substantially lower than Chemours's earlier estimates. The updated estimates were prepared by ERM, as described in their report, based on actual equipment leak monitoring data on outdoor equipment that TEAM Industrial Services, Inc. has recently compiled for Chemours

emissions results from the PSEPVE campaign were used instead to estimate GenX compound emissions during EVE campaigns.

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using EPA Method 21. This work was done as part of Chemours's enhanced LDAR program, report attached as Exhibit 3, which was developed by ERM and submitted to DAQ in January. Earlier estimates had been based on emissions factors developed some time ago by DuPont, not on actual monitoring at the facility. Given the large difference in estimates, Chemours has asked ERM to continue to focus on and further validate the latest estimates.

Polymers and Semi-Works Stacks. As set forth in the table, the emissions of GenX compounds from the Polymers and Semi-Works stacks are estimated at a total of 5.3 pounds. During the week of March 19, 2018, Chemours conducted additional stack testing for GenX compounds on the Polymers and Semi-Works stacks. This was the first testing on the Polymers and Semi-Works stacks. Both stacks had very low emission rates and the total quantity was calculated based on the hourly emissions rate multiplied by the hours of the particular operations.

THE MEASURES CHEMOURS IS TAKING SATISFY THE CONDITIONS IN THE NOTICE

I. The Massive Investment Chemours Is Making In Fayetteville Works Will Dramatically Reduce Air Emissions of GenX.

Chemours is in the process of making a \$100 million investment in Fayetteville Works — a combination of interim measures and long-term, state-of-the art emission control technology that will bring together technologies that we believe no other chemical facility in the world has in combination and that will make the facility a world-leader in emission control. As summarized below, this investment is expected to start substantially reducing air emissions of GenX compounds by an estimated 40% in just a few weeks, to accelerate the reduction to over 70% by October of this year, and to achieve a full 99% reduction, near-elimination, once the full technology is completely installed by the end of 2019 or the beginning of 2020.

Chemours has committed tremendous financial and personnel resources to develop this plan. Since last fall, Chemours's engineers and scientists have devoted over 35,000 person-hours to researching, developing and designing ways to reduce emissions of GenX compounds. Working together with Chemours's outside consultants, and in regular consultation with DEQ, they have put together the plan that is now underway. The plan contains every feasible and effective emission-control-measure that Chemours's team and consultants (and, for that matter, DEQ) have conceived. The plan also provides for implementation of the various measures on the earliest available timeframe to reduce emissions of GenX compounds to the lowest feasible levels as quickly as possible.

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The specific elements of Chemours's investment and emission control plan are as follows.

A. State-of-the-art emission control technology

The full array of emission control technology is diagrammed in Exhibit 4.

As DEQ is aware from prior discussions, the centerpiece of the technology is a thermal oxidizer. As shown in Exhibit 4, the thermal oxidizer works by mixing input streams with oxygen at high temperature to oxidize the GenX compounds and other constituents. With respect to air emissions, the thermal oxidizer will destroy 99.99% of all GenX and other PFAS vapors coming from Vinyl Ethers North, Vinyl Ethers South and the relevant portions of the Polymers plants before they can be emitted to the atmosphere. The thermal oxidizer alone will eliminate approximately 1625 of the estimated 2300 pounds of total annual emissions of GenX compounds (those coming from Vinyl Ethers North, Vinyl Ethers South and the relevant portions of the Polymers plants).

Chemours has placed an order for the construction of the thermal oxidizer with Linde Engineering North America, Inc., a world leading engineering company with vast experience in manufacturing thermal oxidizers.⁵ The thermal oxidizer alone will cost \$40 million. Delivery is expected in May or June of 2019. In addition, while DEQ informed Chemours that a construction permit was not required to place the order, we understand that one will be required before the thermal oxidizer can be installed. Accordingly, Chemours is fully engaged in preparing the permit application for submission to DAQ in the next 60 days. This is being expedited by Chemours to help ensure that the permitting process will not delay installation and operation of the thermal oxidizer.

In addition to the thermal oxidizer, the emission control technology contains other elements to address sources of GenX compounds in wastewater that cannot be efficiently addressed by the thermal oxidizer. These include a thermolysis reactor and ion exchange and carbon adsorption controls to address various aqueous streams. The combination of these elements will make Fayetteville Works unique: while some facilities have *some* of these elements — for example, the thermal oxidizer is a proven technology that has been

⁵ See <http://www.leamericas.com/en/technologies/fired-process-equipment/incinerators-thermal-oxidizers/index.html>.

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used successfully elsewhere — we are not aware of any facility in the world that has *all* of the elements.

B. Interim measures

This technology consists of custom-designed, specialized equipment that must be custom-built and will take approximately 18-24 months to manufacture and install. As noted, the thermal oxidizer will be delivered by the manufacturer in May or June 2019. It then must be installed at the facility and integrated with the other elements, a process that will require major construction at the facility (and involve the creation of over 200 North Carolina construction jobs).

Accordingly, Chemours is also taking multiple additional measures in the interim that will substantially reduce air emissions of GenX compounds while the full suite of technology is built and installed. These include every feasible and effective measure that Chemours's team has conceived (and every feasible and effective measure that DEQ has proposed) to address air emissions in the interim. These interim measures include the following.

1. Measures already taken

As we have previously reported to DAQ, Chemours has already taken a number of interim steps to reduce air emissions of GenX compounds, including:

- ∞ Installed demister pad on the Division stack to increase scrubbing efficiency.
- ∞ Made process changes such as vessel pressure set points to minimize/eliminate venting.
- ∞ Upgraded piping systems to reduce potential for leaks and installed low emissions valves in multiple process locations.
- ∞ Implemented helium leak testing in applicable areas to improve equipment commissioning.

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2. Carbon adsorption systems (May 2018)

As previously communicated to DAQ and as summarized in Exhibit 4, Chemours is moving forward in the coming weeks to install carbon adsorption systems to supplement the existing scrubbers in reducing process and indoor air equipment emissions from the PPA facility. Chemours is also installing a second carbon adsorption system to reduce indoor air equipment emissions at the Vinyl Ethers North facility. These systems will be installed by May 25, 2018, with the objective of reducing emissions of GenX compounds by more than 97% at the PPA facility and by more than 90% from indoor air at the Vinyl Ethers North facility.⁶ In addition, Chemours plans to replace the carbon beds frequently (every 6 months) to maintain efficiency. Because these systems will address the 670 pounds of air emissions from the PPA facility at over a 97% efficiency, Chemours expects that they will eliminate, beginning in just weeks, approximately 650 of the 2300 pounds of estimated air emissions of GenX compounds.

3. Improvements to Division Waste Gas Scrubber (May/October 2018)

Chemours will also make a series of interim improvements to the Division Waste Gas Scrubber to reduce process emissions from the Vinyl Ethers North facility (estimated at 1506 pounds in 2017). The initial upgrade to the existing waste gas scrubber at the Division stack, which will be completed in May at the same time the carbon adsorption units are installed, is expected to have relatively small improvement in efficiency, estimated at approximately 10% over current levels. Further upgrades, which will be completed by the time of the October 2018 facility turnaround, will be based on further stack testing at the Division stack and are expected to reduce emissions by 40-80% from current levels. These are further described in Exhibit 4.

4. Enhanced LDAR program (underway and continuing)

Although the latest Method 21 estimates of outdoor fugitive emissions prepared by ERM are much lower than had been previously thought, Chemours is still committed to implementing an enhanced LDAR program in accordance with ERM's recommendations, so as to reduce emissions to the maximum extent possible.

⁶ It is expected that the carbon system at Vinyl Ethers North will accomplish significantly more than 90% control, but given the very low level of GenX emissions now estimated to come from indoor air emissions at that facility, Chemours is targeting and proposing below to commit to a 90% control level.

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To that end, Chemours has followed the recommendations in ERM's January 2018 LDAR Report (Exhibit 3) in accordance with the schedule previously communicated to DAQ. Specifically, Chemours has: (i) implemented pressure testing using a 0.5 psig pressure drop over a 30-minute interval; (ii) implemented an enhanced AVO inspection procedure; (iii) conducted a successful experimental evaluation to verify that the TVA-1000B would detect vapors of DAF; (iv) retained TEAM Industrial Services, Inc., which has tagged new LDAR points in the Vinyl Ethers North, Semi-Works and PPA areas and completed initial Method 21 monitoring using the TVA-1000B (the Vinyl Ethers South area will be tagged before the next campaign of PPVE); (v) conducted an evaluation of the preferred method to implement enhanced area monitoring, and, as a result, decided to increase the number of area monitoring sampling locations, specifically near those streams with the potential to include 1% by weight of GenX compounds; and (vi) conducted an evaluation of the preferred methods to implement replacement or improvement of valves and connectors, and, as a result, decided to use the LDAR monitoring to initiate replacement with low-emission technology (and maintain an inventory of these components). Chemours will also continue to consider and assess other possible means to reduce further its outdoor emissions of GenX compounds, and as noted above, has asked ERM to continue to focus on the quantification of such emissions.

C. The expected schedule for reductions in air emissions

The interim and long-term measures and technology will yield a substantial reduction in air emissions of GenX compounds almost immediately, will greatly accelerate the reduction by the end of the year, and will result in the virtual elimination of those emissions once the full technology suite comes on line. The expected timetable and reduction levels are as follows:

1. By May 31, 2018

By the end of next month (May 31, 2018), Chemours will have:

- i) installed the carbon adsorption system to address process and indoor air emissions at the PPA facility, with the expectation of reducing those emissions by in excess of 97%;
- ii) installed the carbon adsorption system to address indoor air emissions at the Vinyl Ethers North facility, with the expectation of reducing those emissions by in excess of 90%; and

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- iii) made the initial upgrades to the Division Waste Gas Scrubber to address process emissions from the Vinyl Ethers North facility, with the expectation of reducing those emissions by approximately 10%.

Further, because Chemours will not run any PPVE campaigns at the Vinyl Ethers South facility in 2018, we anticipate that emissions of GenX compounds from that facility should be on the order of just a few pounds this year.

Taking all of the above reductions into account as shown in the table below, by just the end of next month, Chemours anticipates that it will reduce annualized emissions of GenX compounds by over 900 pounds, or approximately 40%.

Process Area	Process Emissions (lbs)	Indoor Equipment Emissions (lbs)	Outdoor Equipment Emissions (lbs)	Total Emissions (lbs)
VE North	1506.4 1355.4	2.5-0.3	1.7	1511 1357.4
VE South	114.0-7.6	1.6-0.1	0.4	116-8.1
PPA	638.8-19.2	31.2-0.9	1.0	671-21.1
Polymers	4.8	0	0	4.8
Semi-Works	0.35	0.15	0	0.5
Total				2302.6 1391.6

2. By October 2018

Within six months (October 2018), Chemours will have (i) installed further upgrades to the Division Waste Gas Scrubber to address process emissions from the Vinyl Ethers North facility, which is expected to reduce those emissions by approximately 40-80%; and (ii) installed low-emission replacement valves and connectors for any outdoor equipment found to be leaking. Taking these above reductions into account (using the 60% range midpoint for the upgrades to the Division Waste Gas Scrubber), within six months (October 2018) Chemours anticipates, as shown in the revised table, that it will have reduced annualized emissions of GenX compounds by approximately 1700 pounds, or over 72%.

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Process Area	Process Emissions (lbs)	Indoor Equipment Emissions (lbs)	Outdoor Equipment Emissions (lbs)	Total Emissions (lbs)
VE North	1506.4 602.4	2.5-0.3	1.7	1511-604.4
VE South	114.0-7.6	1.6-0.1	0.4	116-8.1
PPA	638.8-19.2	31.2-0.9	1.0	671-21.1
Polymers	4.8	0	0	4.8
Semi-Works	0.35	0.15	0	0.5
Total				2302.6 638.9

3. By end of 2019 or early 2020

By the end of 2019 or early 2020 (no later than April 30, 2020), Chemours expects to have installed the thermal oxidizer to reduce by 99.99% the process emissions of GenX compounds from the Vinyl Ethers North, Vinyl Ethers South and Polymers processes. Chemours has expedited this schedule to the maximum extent possible, and will make all efforts to expedite it further.

Once the thermal oxidizer is installed, Chemours anticipates that, as shown in the following revised table (using a minimum 99.9% efficiency for the thermal oxidizer), it will have reduced annualized emissions of GenX compounds from 2300 pounds to fewer than 30, a reduction of 99%.

Process Area	Process Emissions (lbs)	Indoor Equipment Emissions (lbs)	Outdoor Equipment Emissions (lbs)	Total Emissions (lbs)
VE North	1506.4 1.5	2.5-0.3	1.7	1511-3.5
VE South	114.0-0.1	1.6	0.4	116-2.1
PPA	638.8-19.2	31.2-0.9	1.0	671-21.1
Polymers	4.8-0.0	0	0	4.8-0
Semi-Works	0.15 0.35	0.15	0	0.5
Total				2302.6 -27.2

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D. Chemours's comprehensive efforts to address existing groundwater contamination

Finally, because the Notice concerns the impact of air emissions of GenX compounds on groundwater, it is important to consider not just what Chemours is doing to reduce air emissions, but also the broader context of everything Chemours is doing (again, in close coordination with DEQ) to remediate existing groundwater issues and to address other areas of concern. These efforts are detailed in Exhibit 5 and are summarized here.

1. On-site groundwater

Chemours has undertaken significant facility investigation efforts and sampling programs to understand and address existing groundwater contamination of GenX compounds at the facility site. Chemours developed and put in place a comprehensive program to investigate GenX compounds and other PFAS in on-site soil and groundwater, and to consider source control and other remedial measures. In so doing, Chemours has completed in under six months processes that typically take multiple years to complete. As part of these efforts, Chemours has submitted to DEQ an Additional Investigation Work Plan on October 31, 2017; an Additional Site Investigation Report on January 31, 2018 (Exhibit 6); a description of interim groundwater remediation actions on February 26, 2018; a Focused Feasibility Report on February 28, 2018, identifying the technical remedial options available for addressing PFAS contamination at Fayetteville Works (Exhibit 7); and a Focused Remedial Action Plan for PFAS in Groundwater on March 28, 2018 (Exhibit 8).

Following the submission of these reports, Chemours has begun to implement aggressive source control measures. These include: (i) cleaning out and lining the Contact Cooling Water Channel (formerly referred to as the Nafion Ditch), which presently carries up to five to eight million gallons a day of non-contact cooling water from the Nafion/IXM facility to Outfall 002; (ii) lining two large surface impoundments used to collect sediment generated during the filtration and clarification of intake water from the Cape Fear River; (iii) controlling groundwater migration into the Old Outfall 002 channel; (iv) pumping and collecting water from the highest concentration wells in the Perched Zone; and (v) undertaking an extensive program to wash equipment and facility components to remove residual contamination of GenX compounds. For full details, see Exhibit 5.

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2. Off-site groundwater

Chemours has also responded to the elevated levels of GenX detected in private wells near Fayetteville Works. Since early September 2017, Chemours has conducted a residential well sampling program near the facility. It has offered bottled water to all residents within the scope of the sampling program whose test results are pending or whose wells test at or above 140 ppt. On January 11, 2018, Chemours submitted to DEQ a Carbon Implementation Plan proposing to offer granulated activated carbon (“GAC”) treatment at Chemours’s expense to those residents whose wells test at or above 140 ppt. At the request of DEQ, Chemours agreed to delay offering GAC treatment to these area residents until it conducted a Pilot Test on the effectiveness of GAC at six private wells. The GAC systems have been installed at the six selected pilot wells and sampling of the systems’ effectiveness is in progress. The submissions with respect to the off-site program are attached as Exhibit 9. In addition, recent reports have validated the effectiveness of GAC treatment. Chemours is hopeful that it will soon receive permission to proceed with providing GAC treatment to these area residents.

II. Chemours Satisfies The Notice’s Requirements: Ongoing Air Emissions Will Not Increase The Levels Of GenX Compounds In Groundwater, And Those Levels Will Decrease As The Reductions In Air Emissions Take Effect.

The Notice states that DAQ will purport to modify the permit for Fayetteville Works “to prohibit emissions of GenX compounds” unless Chemours shows that it meets one of two stated conditions. Specifically, it states that “By April 27, 2018, Chemours must do one of the following: (1) respond to DAQ in writing and demonstrate to DAQ’s satisfaction that emissions of GenX compounds from the Fayetteville Works under current conditions do not cause or contribute to violations of the groundwater rules; or (2) respond to DAQ in writing and demonstrate to DAQ’s satisfaction that emissions of GenX compounds under alternate conditions proposed by Chemours will not cause or contribute to violations of the groundwater rules.” The purported “groundwater rules,” in turn, refer to the 10 ppt minimum detection “practical quantitation limit” for GenX. In other words, DEQ is asking Chemours to demonstrate that its operations, either currently or under alternate conditions, will not cause groundwater levels of GenX compounds to increase by more than 10 ppt over current levels.

A. Chemours believes that the potential modification and conditions referenced in the Notice are inappropriate given all the measures described above and are without legal basis in any event. Chemours also believes that the extraordinarily limited timeframe imposed by DAQ (3 weeks) is unfair and accordingly reserves the right to

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supplement its analysis. Nevertheless, it has endeavored to be in a position to make the requested showing within the requested timeframe.

Chemours retained two nationally recognized environmental consulting firms, Geosyntec and ERM. The firms performed two different analyses, each of which shows that Chemours's operations will not cause groundwater levels of GenX compounds to increase by more than 10 ppt over current levels. Their methodologies and conclusions are summarized below, and their full reports are attached as Exhibits 10 and 11, respectively.⁷

First, Geosyntec analyzed the existing groundwater conditions in the area of the facility. As Geosyntec fully explains in its report, the available evidence indicates that the groundwater in the area of the facility, which has been impacted by decades of deposition of GenX compounds (mostly before Chemours existed), is likely in a steady state. Geosyntec accordingly concludes that the current level of air emissions will likely neither increase nor decrease existing groundwater concentrations; rather, the groundwater concentrations will remain constant.

But of course, Chemours will not be maintaining the *current* level of air emissions. As detailed above, Chemours will be reducing those emissions substantially beginning in May and ultimately eliminating almost all of them. Geosyntec's analysis thus shows that, as air emissions of GenX compounds are reduced through the interim measures and control technology, the groundwater levels will start to go down from current levels and will go down at an increasing rate as more of the air emissions measures come on line and emissions are further reduced. Accordingly, Geosyntec's analysis shows that, far from causing an *increase* in groundwater levels of GenX compounds by more than 10 ppt over current levels, Chemours's operations and emission-control measures will permit a *decrease* in those levels.

As Geosyntec explains, "[b]ased on mass balance principles reducing HFPO-DA deposition and infiltration will lead to a proportionate (*i.e.* linear) reduction in groundwater concentrations over time. In other words, a 95% reduction in deposited HFPO-DA means that groundwater concentrations will also decline by 95%, as 95% less mass is being added to the subsurface. Therefore, future groundwater concentrations at residential sampling locations can be estimated using a linear approach where the

⁷ The two reports are consistent. The Geosyntec report opines that the system is in steady state, so that current flushing of the system will be generally equivalent to new air deposition, and with reduced air deposition, groundwater levels will go down. The ERM report only looks at the impact of new air deposition, without accounting for flushing of the system.

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emission reduction factors are applied to present residential groundwater concentrations.” And they further explain that “reducing air emissions of HFPO-DA from the Site will likely lead to corresponding reductions in groundwater concentrations over time.”

Second, ERM has performed air deposition modeling of the reduced emissions levels that will be achieved this year and after the thermal oxidizer is installed. In doing so, ERM used the AERMOD 16216r model,⁸ the same model that DAQ has used for its analysis.

The key elements of this deposition modeling analysis include:

- ∞ Use of the latest version of the regulatory dispersion model and supporting programs: AERMOD (version 16216r), AERMAP (version 11103), and BPIP (version 04274);
- ∞ Use of the AERMOD-ready meteorological data set pre-processed by DEQ with surface meteorological data from the Fayetteville regional Airport (ICAO: KFAY, WBAN: 93740), located approximately 17 km to the north of the facility, and upper air data from Greensboro, North Carolina (ICAO: KGSO, WBAN: 13723);
- ∞ Use of a comprehensive receptor grid designed to identify maximum modeled deposition within 20- kilometers (km) of the facility;
- ∞ Modeling of annual emissions of GenX to determine the average annual total deposition (wet and dry) onto the surface. The average annual total deposition was determined based on five years of meteorological data;
- ∞ Determining deposition based on AERMOD particle deposition Method 2;
- ∞ Including emissions from point sources as well as fugitive sources; and
- ∞ Estimating the effect of deposition on concentrations of GenX in groundwater by applying a recharge rate (amount of rainfall entering groundwater on an annual basis) and a simplified dilution factor representing an average aquifer dilution rate for a period of one year.

⁸ <https://www.epa.gov/scram/air-quality-dispersion-modeling-preferred-and-recommended-models>.

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ERM modelled deposition (*i.e.*, deposition from dry and wet removal processes) assuming particle deposition and the AERMOD Method 2 deposition option. A mean particle diameter of 1.25 microns was assumed along with a total fine mass fraction of 94.4% (*i.e.*, total amount of particulates assumed to be 2.5 microns in diameter or less). The total deposition was then modelled under both the present conditions, the May 2018 (40% reduction), the October 2018 (72% reduction) and 2019/2020 (99% reduction) scenarios. Deposition rates across the 20 km modeled domain were decreased in proportion to the emissions decreases.

ERM then took the predicted areal deposition fluxes, expressed in grams per square meter per year, and utilizing assumptions about the receiving aquifer and dilution of levels of GenX compounds that reached groundwater, calculated an annual loading of GenX to groundwater in parts per trillion. These calculations were performed using modeled deposition rates at the residential locations which have been sampled to date.

The most significant findings are:

- ∞ Under the expected May 2018 emissions levels, the average impact on GenX compound levels in groundwater at residential well locations would be approximately 5.4-7.5 ppt per year.
- ∞ Under the expected October 2018 emissions levels, the average impact on GenX compound levels in groundwater at residential well locations would be approximately 2.5-3.5 ppt per year.
- ∞ Under the expected October 2018 emissions levels, of all the residential locations which have been sampled to date, 97% will have annual impacts of less than 10 ppt, with all the remainder below 20 ppt.
- ∞ Under the expected 2019/2020 emissions levels, the average impact on GenX compound levels in groundwater will be approximately 0.2 ppt per year and *all* of the residential locations which have been sampled to date will have annual impacts of less than 10 ppt.

In other words, ERM's modeling shows that air emissions at the levels that will be achieved through the ongoing emission-control program will not cause groundwater levels of GenX compounds to be impacted by more than 10 ppt per year, and the impacts will generally be far below that level.

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B. Accordingly, Chemours submits that it has made the showing under the first of the Notice's conditions: that air emissions from Fayetteville Works "under current conditions" (existing operating conditions and the planned interim and long-term emission-control measures) will not cause groundwater levels of GenX compounds to increase by more than 10 ppt over current levels. Indeed, as Geosyntec's report shows, air emissions even at current levels (before the upcoming reductions) are not expected to lead to such an increase. Under the terms of the Notice, there is thus no warrant to modify the facility's air permit in any way (and no legal basis to do so in any event).

Nevertheless, Chemours recognizes that portions of the expert analyses just discussed are premised on the installation of the emission-control measures and also recognizes the importance of public acceptance that it will meet its commitments to install those measures. Chemours also recognizes that DAQ might consider the installation of the emission-control measures, though part of current plans, to be "alternate conditions" within the meaning of the second of the Notice's conditions. For those reasons, Chemours is prepared to have its commitments reasonably incorporated into the Permit.

To that end, Chemours is willing to accede to the modification of the Permit to include the following conditions:

1. Chemours shall, beginning on May 25, 2018, and all times thereafter, operate a carbon adsorption system ("CAS-PPA") to control and reduce both process emissions and indoor equipment leak emissions from the PPA facility.
2. Chemours shall, beginning on May 25, 2018, and all times thereafter, operate a carbon adsorption system ("CAS-VEN") to control and reduce indoor equipment leak emissions from the Vinyl Ethers North facility.
3. Chemours shall, by July 31, 2018, conduct emissions testing of the CAS-PPA to demonstrate that the system is achieving a control rate of at least 97% for GenX compounds. In the event the tests show a control rate below 97%, Chemours shall within 60 days submit a proposal for increasing the control rate and/or other equivalent actions to reduce emissions as expeditiously as reasonably possible.
4. Chemours shall, by July 31, 2018, conduct emissions testing of the CAS-VEN to demonstrate that the systems is achieving a control rate of at least 90% for GenX compounds. In the event the tests show a control rate below 90%, Chemours shall within 60 days submit a proposal for increasing the control

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rate and/or other equivalent actions to reduce emissions as expeditiously as reasonably possible.

5. Chemours shall, subject to timely receiving all necessary permits, install and operate beginning no later than April 30, 2020, a thermal oxidizer to control emissions of GenX compounds from the Vinyl Ethers North, Vinyl Ethers South, and portions of the Polymers plants. Chemours shall use its reasonable best efforts to expedite the installation of the thermal oxidizer.
6. Chemours shall, within 60 days of the installation of the thermal oxidizer, conduct emissions testing to demonstrate that the thermal oxidizer is achieving a control rate of at least 99.9% for GenX compounds routed through it. In the event the tests show a control rate below 99.9%, Chemours shall within 30 days submit a proposal for increasing the control rate and/or other equivalent actions to reduce emissions as expeditiously as possible.
7. Chemours shall not manufacture PPVE at the Vinyl Ethers South Facility during 2018.
8. Chemours shall, no later than July 31, 2018, submit its plan for upgrading the Division Waste Gas Scrubber consistent with the options set forth in Exhibit 4 and shall implement such upgrades no later than October 2018.
9. Chemours shall operate Fayetteville Works in accordance with the Enhanced LDAR program set forth in the report from ERM dated January 31, 2018, as addressed in Chemours's response of the same date.
10. Chemours shall have a third-party consultant prepare quarterly reports beginning in the third quarter of 2018 and continuing until the installation of the thermal oxidizer, and annual reports thereafter, containing a quantification, based on the best available information, of the amounts of emissions of GenX compounds from sources at Fayetteville Works during that period.

Finally, Chemours is prepared to discuss these conditions with DAQ, so that DAQ and the public can have full confidence that Chemours will stand behind these commitments.

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III. The Notice's Threat To Modify The Facility's Air Permit To Require Zero Or Near-Zero Emissions Of Gen-X Compounds Is Contrary To Law.

For all the reasons just discussed, Chemours submits that it has met the Notice's requests and that DAQ should conclude that this response adequately addresses the issues the Notice raised. However, we do need to address the Notice's threat that, if DAQ deems the response insufficient, it will modify Chemours's air quality permit "to prohibit emissions of GenX compounds." To the extent DAQ is suggesting that it will impose a zero-emission standard, DAQ knows such a standard would be impossible for Chemours to meet and DAQ has never imposed such a standard on anyone else or as to any other compound.

This is not the time or place to fully catalog or detail all the legal infirmities in that threatened action. That said, we also do not want to leave any ambiguity here: such an action would be improper and illegal. We will briefly outline the reasons why.

A. DAQ lacks authority to modify the Permit

The Permit is a validly issued permit, whose term is to last until March 2021. Neither DAQ in the Notice nor DEQ in its recently filed April 9, 2018 Amended Complaint (in *State of North Carolina v. The Chemours Co. FC, LLC*, No. 17 CVS 580, Bladen County Superior Court) alleges that Chemours has violated the Permit. Under these circumstances, DAQ has no power to modify the Permit, let alone to modify it in a way that it knows would be impossible for Chemours to meet.

1. The Notice attempts to invoke the authority to modify a permit if "[t]he conditions under which the permit . . . was granted have changed." 15A NCAC 2Q.0519(a)(2). It contends that the recent stack tests, which show air emissions of GenX compounds at levels higher than prior estimates, constitute such a change.

That is wrong. Among many other reasons, the reference to the "conditions under which the permit . . . was granted" refers to the conditions that were relevant to the granting of the Permit. Those conditions did not include any information specifically concerning or any limit specifically on GenX compounds. Under North Carolina regulations, the permitting process concerns "regulated air pollutant[s]" and "applicable requirements," each of which are defined terms that do not reference GenX compounds. See 15A NCAC 02Q.0101(a), 15A NCAC 02Q.0501(e), 15A NCAC 02Q.0103(5), (30), (33).

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For this reason, in granting the Permit in 2016, DAQ did not set any limit specific to GenX compounds, but rather set only overall limits for total VOCs, a category that includes GenX compounds among many others. Likewise, the permit application did not require any information specifically concerning GenX compounds, nor DAQ did not ask any questions specifically about those compounds during the permitting process. Instead, as the regulations contemplate, the permit application and DAQ's inquiry focused more generally on total VOCs.

Moreover, it is abundantly clear that DAQ knew full well that the facility's air emissions contained a great deal of VOCs — including a great deal of fluorinated organics. The Permit allows the facility a total air emission of over 230 *tons* of VOCs per year, with 68.9 tons allowed for Vinyl Ethers North alone. And Chemours's 2016 air emission inventory report had reported emissions of over 42 tons of fluorinated organics. These numbers dwarf even the higher emissions of GenX compounds measured by the stack tests: 1.15 tons for the total facility and 0.75 tons for Vinyl Ethers North.

In short, GenX compounds are not specifically addressed in the permitting process, and the increase in the measured amount of their emission is immaterial to Chemours's compliance with the permit limits for the overall class of VOCs that *is* the subject of that process. That increase is not a change in “[t]he conditions under which the permit . . . was granted.”

2. The Notice also claims that DAQ may modify the permit “to carry out the purpose of N.C.G.S. Chapter 143, Article 21B.” Leaving aside whether a vague appeal to statutory purpose could ever suffice to modify a valid permit to require zero emissions of an unregulated compound, the argument fails for a threshold reason: DAQ does not even allege a public health or environmental need for an unprecedented zero-emission requirement now, much less a need that will persist as Chemours implements the interim and long-term emission-control measures.

There are many reasons why DAQ does not even try to do so. *First*, the Notice is based on concerns about increases in groundwater levels in excess of 10 ppt. But the State's health guideline for *drinking* water is 140 ppt. There is no basis for a zero-emission requirement to prevent a 10 ppt increase in groundwater, when the State says that 140 ppt in drinking water is safe. *Second*, DAQ's own regulations provide for allowable air emission levels for compounds that, *unlike* GenX, do meet the definition of “toxic air pollutant[s]” under North Carolina law. This includes a list of chemicals classified as carcinogens, chronic toxicants, acute toxicants and acute irritants, such as known human carcinogens like methylene chloride, perchloroethylene and trichloroethylene. 15A NCAC 02D.1104; 15A NCAC 02Q.0711.

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Moreover, the Notice's appeal to statutory "purpose" simply ignores all the measures detailed above that Chemours is taking to reduce air emissions. Given Chemours's massive investment in emission control and the substantial reductions that will soon begin, singling out Chemours for an unprecedented zero-emission requirement that DAQ has never sought to impose on anyone else and that DAQ does not even allege is necessary to avert a public health emergency would contradict, not further, the statute's purposes.

B. A zero-emission requirement would be contrary to the regulations

The threatened zero-emission modification not only exceeds DAQ's power under the statute, it is also contrary to DEQ and DAQ regulations.

In particular, the Notice's claimed basis for the modification is *not* an air-emission regulation. It is a *groundwater* regulation — a rule that DEQ contends allows it to declare a *groundwater* standard at the 10 ppt minimum technical detection "practical quantitation limit" because DEQ has not yet adopted an interim or final GenX groundwater standard. To our knowledge, DAQ has never even attempted to use this *groundwater* standard as a basis for regulating air emissions, much less requiring zero air emissions. Indeed, the far higher air-emission standards for the myriad toxic pollutants and carcinogens discussed in the preceding section make clear that DAQ does nothing of the sort.

And for good reason. The groundwater regulations govern clean-up of contaminated groundwater; they do not apply to air emissions. Indeed, the Legislature made this clear in amending the statute on which the Notice relies: "A reference to 'discharge' or the 'discharge of waste' shall not be interpreted to include 'emission' as defined in subdivision (12)," which in turn defines "emission" to mean "a release into the outdoor atmosphere of air contaminants." N.C.G.S. §§ 143-213(9), (12).

C. A zero-emission requirement would be arbitrary and capricious.

The threatened zero-emission requirement would also be arbitrary and capricious for multiple reasons. Among other things:

- ∞ Neither DEQ nor DAQ has ever done any of this before, nor are they doing any of this to anyone else now. DAQ has never imposed a zero-emission requirement on anyone else. DAQ has never sought to use a

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groundwater standard to impose air-emission limits. And DEQ has never sought to impose the 10 ppt “practical quantitation limit” on anyone else. To the contrary, as noted above, DEQ has drinking water standards based on risk assessments for notoriously toxic chemicals such as 1,4-dioxane, arsenic, lead, formaldehyde, chloroform, methylene chloride, perchloroethylene and trichloroethylene, which range from 3,000 to 600,000 ppt.

- ∞ For every other business and every other compound, DEQ has instead set groundwater limits through the established IMAC process that has often led to limits far higher than 10 ppt. In no case has DEQ sought to impose the “practical quantitation limit” in the interim. Here, Chemours has submitted an application for an IMAC of 70,000 ppt, a copy of which is attached as Exhibit 12⁹. As explained in the attached toxicity analysis prepared by Dr. Damian Shea of North Carolina State University, the 70,000 ppt amount is scientifically sound, based on conservative assumptions and consistent with the State’s initial drinking water guideline. *See* Exhibit 13. Under the practice they have employed for everyone else, DEQ and DAQ should respect the IMAC process and await its outcome, not arbitrarily predetermine that process by imposing an unprecedented 10 ppt groundwater standard and then using that standard to impose a zero-emission requirement they know is impossible to meet.
- ∞ As discussed above, DAQ does not even allege a public health emergency warranting singling out Chemours for any of this unprecedented action. To the contrary, a 10 ppt groundwater standard and zero-air-emission requirement would be irrational where the State says that 140 ppt in drinking water is safe and where the State allows far higher levels of known carcinogens in both drinking water and air.

Chemours has already taken extensive and proactive measures, and has committed to take many more, to continue operating at Fayetteville Works while substantially reducing emissions of GenX compounds and ensuring the protection of the


⁹ To the extent that there were authority for DAQ to modify the air permit based on impacts to a groundwater standard, then that groundwater standard should be 70,000 ppt, and there is simply no conceivable basis to believe that there are air deposition impacts at that level.

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public. We respectfully request that DAQ work cooperatively with Chemours to address any remaining concerns that DAQ may have in a fair and reasonable manner.¹⁰

Sincerely,

A handwritten signature in black ink, appearing to read "Joel M. Gross". The signature is fluid and cursive, with the first name "Joel" being more prominent than the last name "Gross".

Joel M. Gross

¹⁰ Chemours has done the best it could within the three-week timeframe it was given to respond to the Notice, and hopes that the information it has provided and the commitments it has made will address fully DAQ's concerns. That being said, Chemours fully reserves its rights to submit supplemental information during the 60-day period referenced in the Notice and beyond, and to take any and all other actions that may be available to it under the law.

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LIST OF EXHIBITS

1. Stack Testing Reports:
 - a. The Chemours Company, Fluoromonomers, IXM and PPA Manufacturing Processes Emissions Test Report (with cover letter) (January 22-25, 2018)
 - b. The Chemours Company, Fluoromonomers and PPA Manufacturing Processes Emissions Test Report (with cover letter) (February 26, 2018–March 2, 2018)
 - c. The Chemours Company, Fluoromonomers and IXM Manufacturing Processes Emissions Test Report (March 19-23, 2018)
2. ERM NC, Inc., HFPO-DA Baseline Emission Estimates (April 27, 2018)
3. ERM NC, Inc., Third-Party LDAR Program Review for Fayetteville Works Facility, Fayetteville, North Carolina (January 31, 2018)
4. The Chemours Company, Technical Elements - Air and Aqueous Emissions Abatement Plan for Fayetteville Works (April 27, 2018)
5. The Chemours Company, Chemours Status Report on Interim Remedial Actions (April 27, 2018)
6. Parsons, Additional Site Investigation Report, Chemours Fayetteville Works Site, RCRA Permit No. NCD047368642-R1 (with cover letter) (January 31, 2018)
7. Parsons, Focused Feasibility Study Report - PFAS Remediation, Chemours Fayetteville Works, RCRA Permit No. NCD047368642-R2-M3 (with cover letter) (February 28, 2018)
8. Parsons, Focused Remedial Action Plan for PFAS in Groundwater, Chemours Fayetteville Works, RCRA Permit No. NCD047368642-R2-M3 (with cover letter) (March 28, 2018)
9. Submissions to DEQ with Respect to Off-Site Program:
 - a. Parsons, Carbon Implementation Plan - Chemours Fayetteville (with cover letter) (January 11, 2018)
 - b. Parsons, Comprehensive Residential Sampling Through End of Phase 2, Fayetteville Works Facility, Fayetteville, North Carolina (March 29, 2018)

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10. Geosyntec Consultants of NC, P.C., Assessment of Impact of Current and Anticipated Reduced Air Emissions on Groundwater Concentrations of HFPO Dimer Acid in the Vicinity of the Chemours Fayetteville Works (April 27, 2018)
11. ERM NC, Inc., Modeling Report: HFPO-DA Atmospheric Deposition and Screening Groundwater Effects, Fayetteville Works Facility, Fayetteville, North Carolina (April 27, 2018)
12. AECOM, IMAC Development for 2,3,3,3-tetrafluoro-2-(heptafluoropropoxy) propionic acid (CAS # 13252-13-6) - Chemours Fayetteville Works, Fayetteville, North Carolina (with cover letter) (April 27, 2018)
13. Dr. Damian Shea, Ph.D., North Carolina State University, Proposed Drinking Water Health Advisory Value for GenX: 2,3,3,3-tetrafluoro-2-(heptafluoropropoxy)-propanoic acid (April 27, 2018)
14. North Carolina Department of Environmental Quality, Air Quality Permit No. 03735T43 (December 14, 2016)